

CQ- TV

THE MAGAZINE
for all Hams interested in
AMATEUR TELEVISION
TRANSMISSIONS

Produced for the British Amateur Television Club

March 1952

CQ-TV

Number 12.

Five Shillings per annum.

Third year.

Published quarterly for the British Amateur Television Club at Cheyne Cottage Dukeswood Drive, Gerrards Cross, Bucks. Tel 2935. Copyright reserved.

Editor's Note:

This month we have to announce a considerable reorganisation of the Club. Whilst not wanting to lose the friendly spirit of co-operation that has been so evident to date, it has become apparent that further advantages will ensue if the Club is put on a more substantial basis. As will be appreciated, it is not possible to organise a General Meeting of the Club owing to the very scattered membership, so initially the step of asking various well-known and active members to act as officers of the Club has been taken. It is proposed that the officers shall consist of a Chairman, Secretary, Treasurer, and Committee members to a total of six, who shall, if possible, be representative of the various branches of the hobby. The following numbers were invited to act as the Committee pro temp.

Chairman: Mr Grant Dixon.

23 Wye St, Ross-on-Wye, Hereford.

Hon Sec & Treas.

Mr. M. Barlow G3CV0

Cheyne Cottage, Dukeswood Drive,

Gerrards Cross, Bucks. Tel 2935.

Committee: Mr. F. Rose G3BLV

16, North Bridge St, Sunderland.

Mr. I. MacWhirter G3ETI

18, Queens Ave, Gt. Meols, Wirral, Cheshire.

Mr. D. Bradford G3GB0

9, Oxford Gardens, Denham, Bucks.

Mr. D. Wheele G3AKJ

56, Burlington Gardens, Chadwell Heath

Essex.

These gentlemen, having signified their agreement to stand, have drawn up the following Club Constitution, which is published for the approval of the general membership. The Constitution reads:

- (i). The Club shall be known as the British Amateur Television Club.
- (ii). The aim of the Club shall be the advancement of techniques, and the exchange of information and ideas on subjects relating to the transmission of television signals by amateur radio enthusiasts.
- (iii). Membership shall be open to anyone actively interested in the aims of the Club.
- (iv). The officers of the Club shall be elected annually, and shall consist of a Chairman, Secretary, Treasurer and a Committee, who shall be, as far as possible, representative of all branches of the hobby.
- (v). Hon. Presidents and Vice Presidents may be elected at the discretion of the Committee.
- (vi). An annual subscription of 5/- shall be charged, to include the cost of subscription to the Club magazine "CQ-TV".
- (vii). Club affairs shall be reported in "CQ-TV", and announced at such Club meetings as it may be found possible to hold.
- (viii). The Club shall be affiliated to the Radio Society of Great Britain.

If no formal objection is raised to any of the above procedure before April 6th 1952, the Committee will consider itself confirmed in office, and the Club Constitution will be formally adopted.

No other changes in the Club are contemplated; "CQ-TV" will be the official Club organ, but in cases of doubt, responsibility for published articles will rest with the contributor, and will not necessarily reflect official Club opinion.

(over)

Editorial, contd.

This month also sees a change in our external publication situation. Following last month's inserted sheet concerning our relations with the various publishing houses, arrangements have now been made for our bi-monthly notes to appear in the RSGB "Bulletin". We should like to express our appreciation of the hospitality afforded to us by the "Short Wave Listener and Television Review" in the past. It is to be hoped that this change will bring our activities to the notice of a wider circle of transmitting amateurs and interested parties.

NEW MEMBERS THIS MONTH

Russell L. Spira	W2UFU	37-10 Thirty Third St, Long Island City 1, N.Y.
R. A. Gower		218 Lower Addiscombe Rd, Croydon, Surrey.
A. R. Land		10, Kimberley St, Bradford.
A. C. Bevington	G5KS	283 Poplar Grove, Gt Horton, Wibrey, Bradford.
R. C. Dabbs	G2RD	128 The Chase, Wallington, Surrey.
Jack Lane	G3AAW	9 Middle Spilmans Rd, Rodborough, Stroud, Glos.
R. T. Torrens	GISFWY/T	Braeduje House, Drumbo, Lisburn, N.I.
R. L. Buchanan		c/o Christ Church College, Oxford.
K. Hathaway		Ferndale, Lower Rd, Chalfont St Peter, Bucks. (113)

Change of address: D.P. Rafferty is now at 30 Porchester Terrace, W2; 5089519
SAC Raby R. D G3IDR is now at 300 Signals unit, RAF Hilhorn B10R 25.

THIS MONTH'S SHORT NOTES

Fred Rose G3BLV puts forward the idea of drawing the sync pulses onto a large paper disc, reducing them photographically, and then using a FEC for pickup. Anyone like the job?

Has anyone data on the Telefunken LS180 please? Apart from data in Vade Mecum. The 4C27 advertised in the mags is equivalent to the CV92; RCI quote 6.0V 6.5A 6kV max 150 watts dissipation at 750 mc/s, $\mu = 22$.

URGENTLY REQUIRED: Photographs of general interest of gear, and (particularly) results to illustrate articles in the RSGB Bulletin. Photos will be returned if needed, and may be paid for.

Sked times: 11 a.m Sundays HF end of 40 m; 2 p.m Sundays 3700 kc/s. Anyone around please call, as G3CV0 may not be available.

G3CBO requires 4-65As cheap. Anyone have a source of 6SN7s? A few 7185s cheap from G3CV0. Require button base tubes, and 70 cm PAs.

George Short finds the MW6-2 Mullard projection unit with corrector plate for wall projection gives a 4' x 3' scanned area for Flying Spot work, when used with an f3.5 2" lens in front of the 951A. This tube is no good for telestill work, though. Cost: £8 if you can get one. Suitable lenses for this sort of work are available from Harringay Photo Supplies, 423 Green Lane N4. 8" f2.9 £5; 5" f4 £6-10.

Anyone tried a spot wobble method? Details please.

Bengt Barklund suggests the use of a Constant Voltage Transformer instead of a regulated PS U. Rectify in the normal way. Try a "Sola" job, surplus (?). There will not be a separate TV Convention this year unless the RSGB show is cancelled.

Will all licensed members please send in a list of bands worked? For the record, and to improve sked times.

RSGB EXHIBITION NOVEMBER 1952

By arrangement with the RSGB, it has been tentatively agreed that the B.A.T.C. should have a stand at this year's RSGB Exhibition. This takes place about the third week in November, in London. The room available for an exhibit is very limited, and it may not be possible to have a live camera unit in action. However, it is hoped to show the following items of equipment, whether or not they are in action: a 5527 camera, a 16mm telecine unit, a simple telestills scanner; a "See-Yourself" booth (Flying Spot scanner and monitor); 70cm TV converters; possibly a 70 cm TV tx. Some of these units have already been promised by various members, but knowledge of where we can get a spare in an emergency will be useful. If, therefore, your equipment works satisfactorily, i.e. 2 m/s bars are resolvable, and the picture looks reasonable, then **NOW IS THE TIME** to start making it also **LOOK** good. We all know that these things work better in a haywire condition, but let's have something comparatively neat for the exhibition. If you start **NOW**, there should be enough time to iron out the snags. We are not expecting a professional finish, of course, but it is a wonder what a coat of grey paint will do for some of those chassis with umpteen holes in! A few matching knobs of equal size help, too. One last point - no exposed EHT lines, please.

In addition to gear, a few members will be required each of the 3 days of the show to man the stand. Volunteers are welcomed. We also need suitable film (16mm silent) to be shown, or the loan of a 16mm cine camera. Comments and suggestions on the above, please, to the Hon Sec.

THE 5527 ICONOSCOPE SITUATION

Mr. Hickman has informed the Hon. Sec. that the import of 5527s for amateur purposes has been stopped for the time being, and that he does not think there will be any easing of the situation for some time to come. The official rejection from the B.O.T. was in these terms:

"The matter has received the fullest consideration, but licences cannot be granted for the purposes of amateur experiments. We suggest that enquiries be made of Messrs. E.M.I and English Electric Co for suitable alternatives."

We are once again cut off from any source of small TV camera tubes, therefore, as none of the English manufacturers make anything suitable. However, it is possible that in the next 12 months or so the situation may ease, either as regards dollars or English tubes, and members should not become despondent!

BACK NUMBERS OF "CQ-TV"

A few back numbers of Nos. 9, 10, and 11 are available for a small contribution to Club funds. Earlier editions are quite out of print, and in any case the circuits and data given therein are in many cases now obsolete due to the rapid advances made in the last three years. They are mainly of historical interest, therefore.

A SIMPLE, EASILY REPRODUCED 70 CM CONVERTER FOR TV USE.

The basic design of the unit is due to Tony Sale, and is put forward not as a perfect design but as something to work upon. The unit is planned to be as economical in time, money and components as possible, but to be reasonably efficient. Consequently, complicated plumbing has been omitted, and the only metalwork required is well within the scissors and kitchen table range. Output from the unit is at a suitable frequency for feeding into a standard BBC TV receiver.

Figure i shows the mechanical construction of the unit. The chassis can be made of tinplate, brass, copper or aluminium, but should be fairly firm. 18 swg brass is ideal. The actual shape of the chassis is immaterial, the one shown being designed to fit on to the bottom of one of the 2 EF56 type of 45 Mc/s pre-amplifiers available surplus. If any other TV channel is employed, then room must be left for a pre-amplifier tube and circuitry. No HF stage is employed, the antenna being fed straight into the mixer trough via a loop or direct tap onto the centre conductor. The trough is of 1" square cross-section, and the centre conductor - $\frac{1}{4}$ " brass or copper rod or pipe, silver plated for preference - is soldered to one end of the trough, the other end of the rod being supported by the fixed plates of the mixer tuning condenser C1. Standard variable condensers are used here and in the oscillator for economy, and also to cover the 30 Mc/s of the TV band. The original design used two fixed and two moving plates, spaced about $\frac{1}{8}$ " or so.

The oscillator operates on about 200 Mc/s; whilst stability is not so vital as in a cw receiver, care should be taken to ensure that the osc. does not drift too far. Almost any tube can be used, 955s, $\frac{1}{2}$ 6J6s, 6J4s etc. Injection is by means of a probe about 1" long from the osc anode into the "hot" end of the trough. The position of the probe can be adjusted until optimum crystal current (200 - 500 μ A) is obtained. The mixer crystal, a CV102 or similar, is tapped on as shown. Use an English octal top cap for one contact, and an EA50 connector for the other. On no account attempt to solder to the crystal holder itself. A 15pF RF bypass condenser is soldered as close to the crystal as possible, and output to the preamp is taken via a short piece of co-ax. Fig ii shows the circuit diagram of the osc/mixer unit. Output from the pre-amp is via a link coil around the anode coil to a co-ax lead to the TV set. The converter and pre-amp should be placed in a weather-tight box, and attached to the back of the aerial array. It might be possible to dispense with the pre-amp and build the converter into the TV cabinet when the aerial lead-in is not too long, but this has not been tried. As shown, the converter covers 400-470 Mc/s.

Comment has come in from G2DD and G6YP, who suggest that it might be better to use the arrangement of Figure iii. The oscillator is, say, a 6J6 operating on 136 Mc/s, with one half trebling to 400 Mc/s. An adjustable capacitative probe adjusts the injection, and tuning of mixer and osc is by means of some added capacitance, e.g. a brass plate moving in and out of the open ends of the lines. The lines are calculated to have a surge impedance of about 80 ohms, giving feed points about $3/4$ " from each end. Thus an 80 ohm antenna lead can be tapped straight on opposite the injection probe.

We shall be extremely interested to hear of results with this equipment, and any modifications tried. Further articles in this series will cover the problem of 70 cm TV antennas. Remember the GPO require you to have your TV licence endorsed for ham TV....

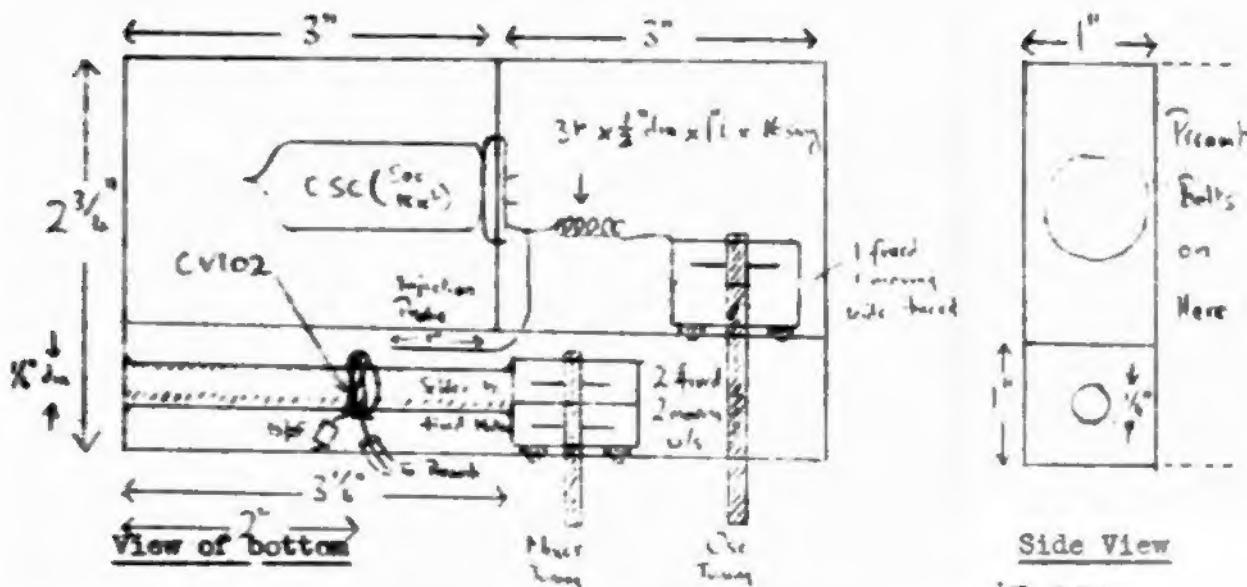
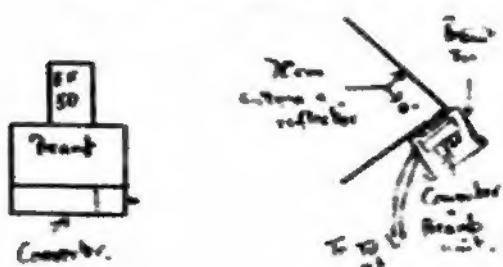


Fig 1. Construction of unit.



Left: View of complete unit.
Right: Unit mounted on antenna.

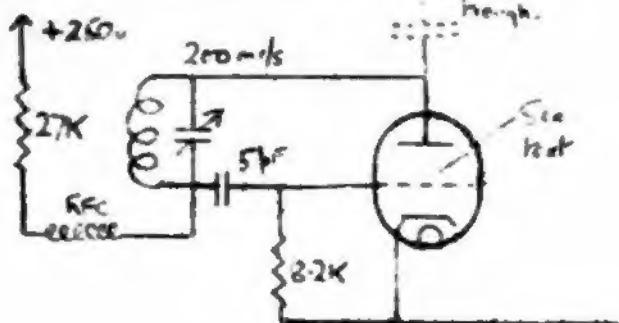


Fig ii. Circuit of 200 mc/s oscillator for unit.

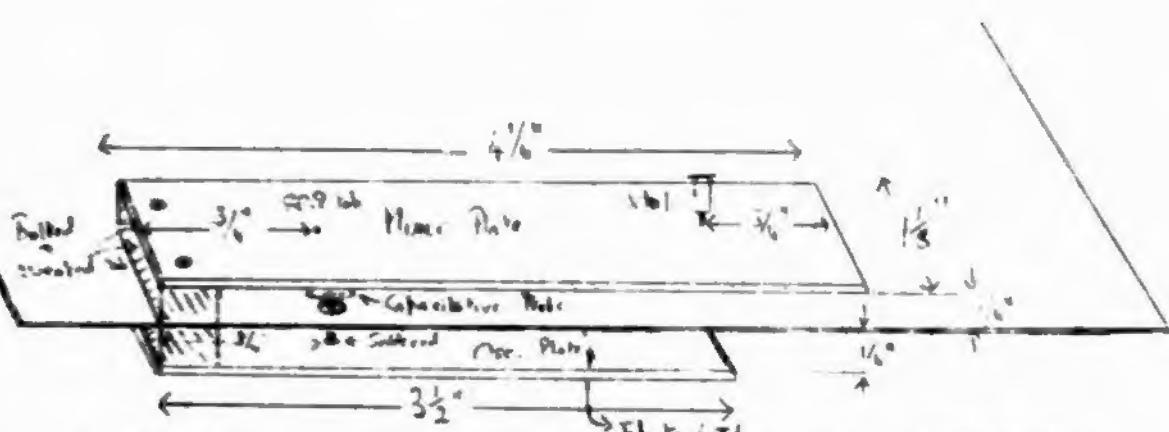


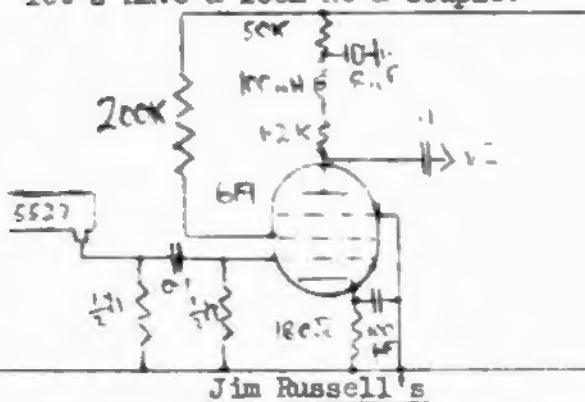
Fig iii: Modifications for use with 6J6 osc/trebler (per G2DD). The lines are made from 16 s.w.g copper, brass or aluminium.

SOME 5527 CIRCUITS

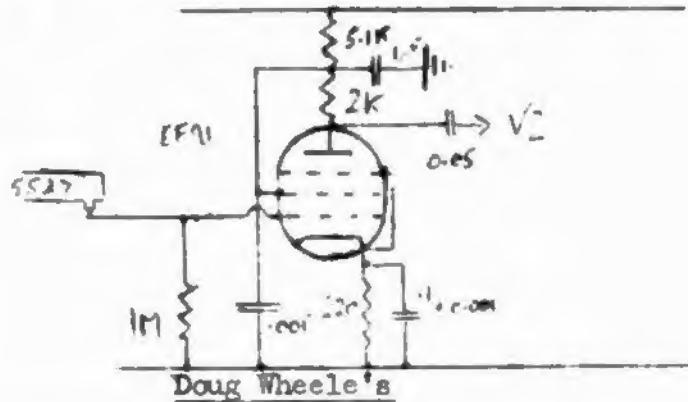
In response to appeals, here are some points that arise when comparing the various circuits used by the live camera men. Remember, they do not need nearly so much HF peaking as the telecine and telestill group, so do not use these circuits indiscriminately!

i. The Video Amplifier

A three or four stage pre-amp seems common; Doug Wheele uses EF91s and 6AC7s, Ivan Howard uses EF50s, Tony Sale uses 6AC7s, Hendrik de Waard 6A1K5s, and Jim Russell 6F1s and 6AC5s. The circuit is a straight-forward RC coupled amplifier with compensation coils. No-one seems to like (nor use) the official RCA circuit, and any of those given produce better results by far than RCA's. Naturally, the first stage is very important, so let's have a look at a couple:

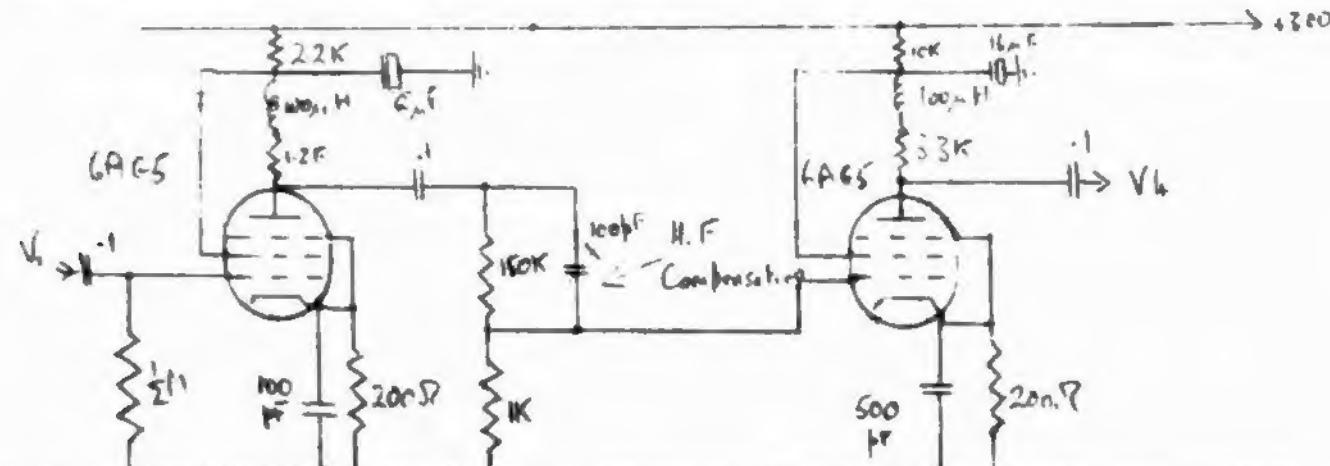


Jim Russell's

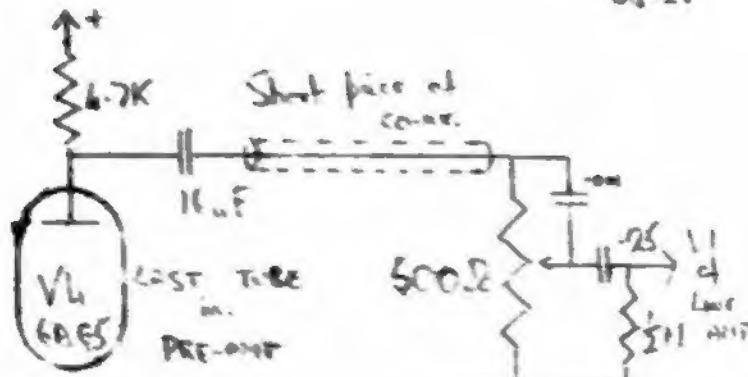


Doug Wheele's

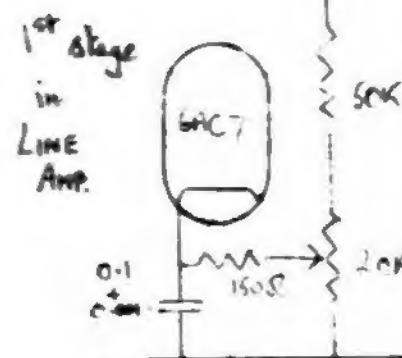
Doug's second and third stages (EF91 and 9008) are the same as V1, whilst Jim has an adjustable compensation control between stages:



Jim follows these up with another 6AC5 to a video gain control; Doug uses a more standard method feeding another 6AC7 and then a 605 cathode follower. Jim's method has the advantage of simplicity insofar as there is no need for a cathode follower between pre-amp and line amp, but Doug keeps his wires short and all is OK. Neither quotes a figure for output voltage from the camera unit, but presumably this is in the region of 1-5 volts. This is fed to 70 ohm co-ax in most cases, this lead being kept well away from any others. Jim decouples all power leads where they enter the camera unit, but otherwise they



Gain control systems: L. Jim Russell's



R. Doug Wheele's.

Contd.

are unscreened. For anyone with a supply of good cables, a double cathode follower giving push-pull outputs to a TWIN screened pair will usually cure all cross-talk troubles between cables, and the same method is recommended when heavy deflection currents, etc have to be passed up to the camera. Borje Cederqvist, who works at the Finnish Cable Co, has a nice cable: 3 co-ax plus 15 others!

For viewfinders, almost any 3" tube does, although George Short uses a VGR97 in a detachable top unit, and GH2NL has none on the camera. Jim uses a 3 stage 6FL2 viewfinder amplifier, but other workers seem to find one stage sufficient.

In regards mechanical construction, there is a considerable amount of ingenuity displayed. All units move the 5527s for optical focus; George Short has 3 ex-W.D lenses mounted in a turret rotatable by a large knob at the rear. Optical focussing is usually by a lever or knob at the right side of the camera (for right handed operators). Deflection circuits are usually in the camera unit, sync being supplied up the camera cable. All units appear to have self-running timebases, and many use these TBs to generate the master sync pulses. Doug Wheele has his pre-amp mounted vertically to keep leads short; Piff ZX has the pre-amp over the top of the 5527. As most units are designed for one man to control, the majority have all essential controls on the back of the camera: viewfinder brill and focus, 5527 bias and focus, optical focus, shading, and video gain. Other controls are preset inside the camera case. A variety of mountings is employed, from an old floodlamp stand through plumber's delights in electrical conduit, to a pram. G3CVO is looking for an old icecream tricycle with a fixed wheel for use as a camera dolly! In general, only pan and tilt movements are incorporated, the camera height being fixed, or at least pre-set. Some units have the power supplies and pulse generators built into the bottom of the camera dolly, whilst others use large racks, or merely leave bits scattered around on the floor.

The sensitivity attained seems to vary slightly from tube to tube, but is also governed by the particular video amplifier in use. G2DUS uses a pair of photofloods, GH2NL two 300 watt bulbs, and George Short a single 100 watt bulb under roughly similar conditions for title cards.

There are certainly other members with experience of 5527s; would they please send in circuits and relevant information for the file, and for future publication. The originals of the above data can be borrowed from the Hon Sec for a S.I.E.

AN INTERLACE GENERATOR FOR 405 LINE WORKING

By Ian Macwhirter, G3ETI.

The waveforms produced by this unit are identical with those used by the BBC. All pulses are continuously variable in width over a reasonable range. In places the circuit is unnecessarily complex, and some simple modifications will be mentioned.

Figure 1 shows a block diagram of the unit. V1 generates 50 cycle pulses of 400 μ s duration of both positive and negative polarity. These pulses are used to open and close the line and half-line gate valves, V6 and 7. V2 is a buffer amplifier, and rings the tuned circuit LC at 20250 cps via a Germanium diode. One half of V3 is just NOT oscillating in the absence of an input from V2, and the other half of V3 squares up the 20250 cps output. V4 is the half-line pulse generator locked to V3ii, and gives a 10 μ s pulse. This tube also locks V5, the line pulse generator, which generates a 10 μ s pulse at 10125 cps. Output from the two generators is applied to the gate valves giving a serrated 400 μ s pulse used for frame sync. followed by 10 μ s line sync pulses.

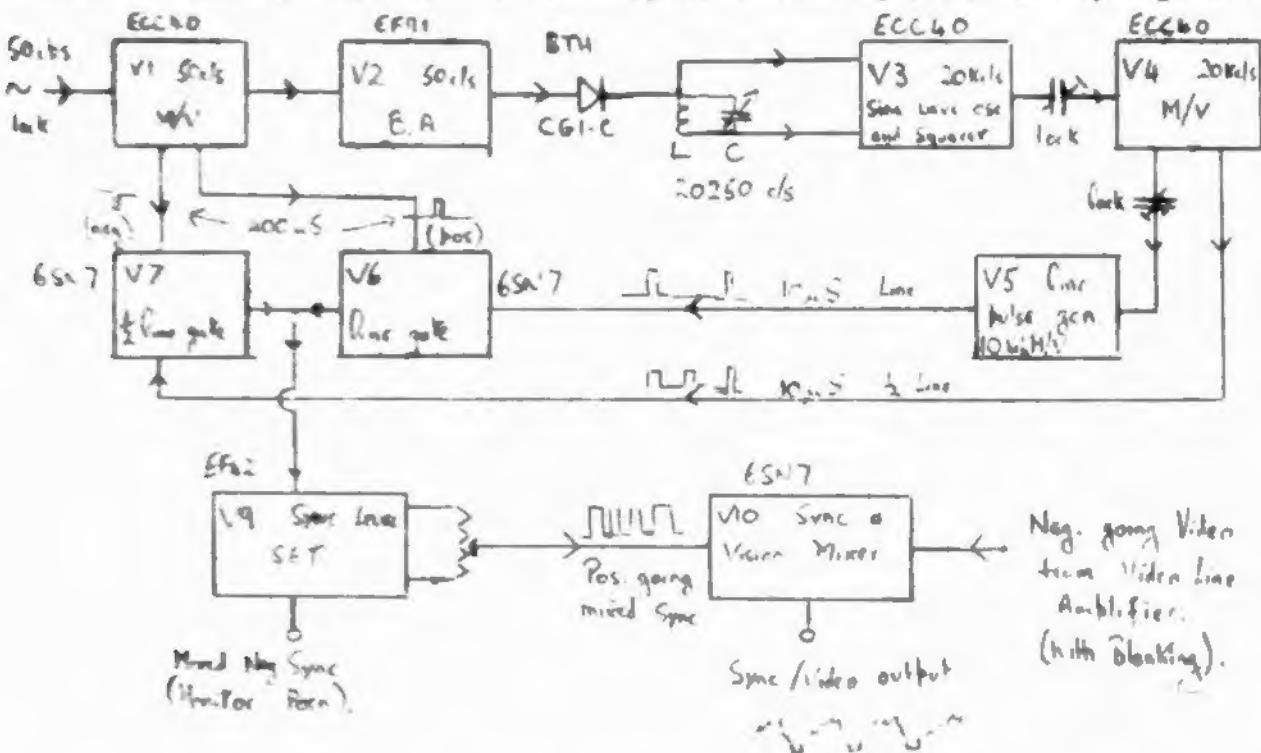


Figure 1. Block diagram of interlace generator.

Setting up is best done with the aid of an oscilloscope with a calibrated time scale, eg the Gossor L035. Although the unit is stable for long periods, it does require slight adjustment from time to time, and it is recommended that the pulse output be continuously monitored. A modification that would doubtless help would be to remove the crystal and its associated oots and to insert a standard frequency dividing and control circuit between V3 and V1 in the usual manner. With a reasonable sync separator in the monitor, a 50-50 interlace is easily obtained. Individual circuits can easily be changed, for instance, two pentodes may be used as per Tony Sale for the gate circuit, but the circuit as shown can be recommended for all normal use.

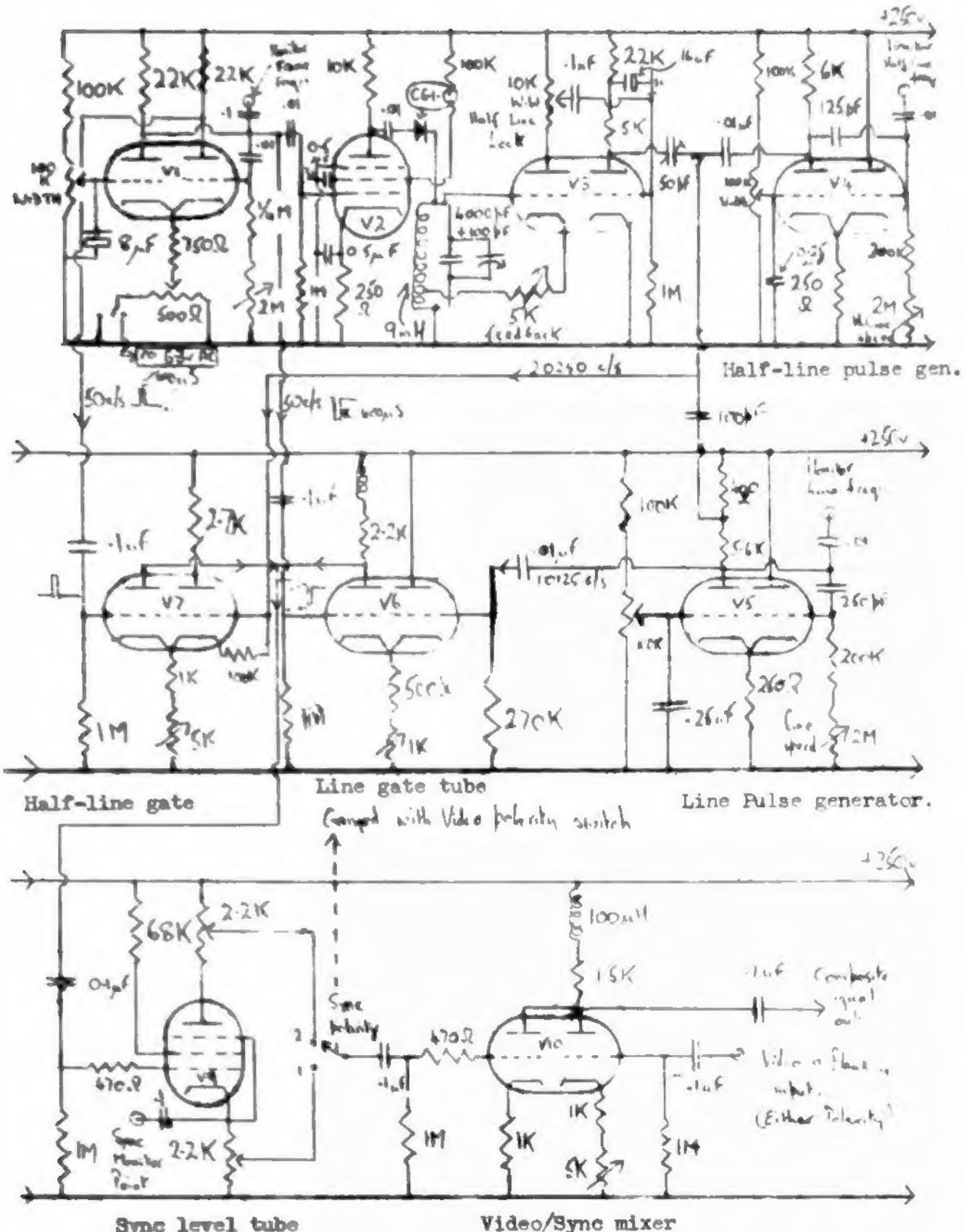
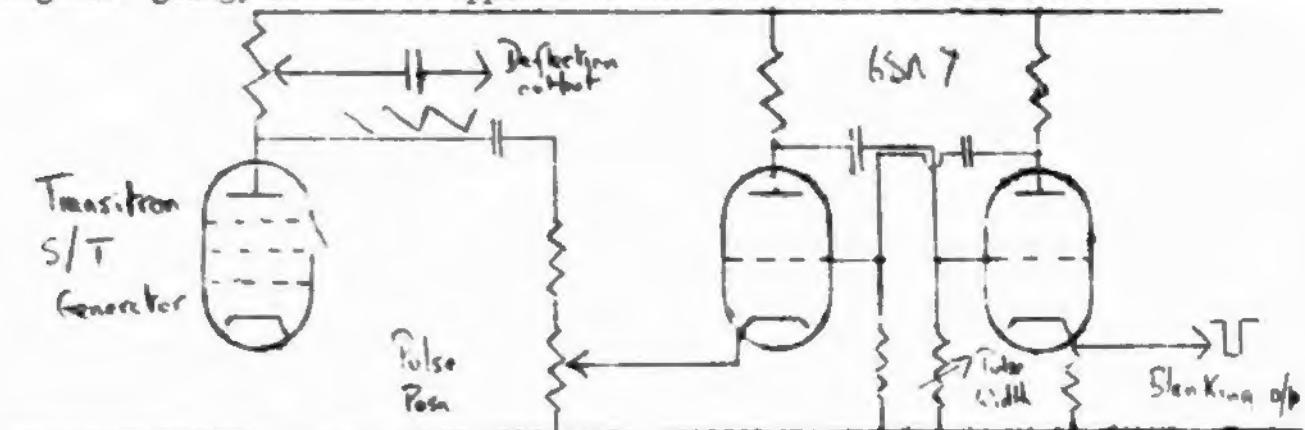


Figure 11. Circuit diagram of GSETI's 405 line interlace generator.

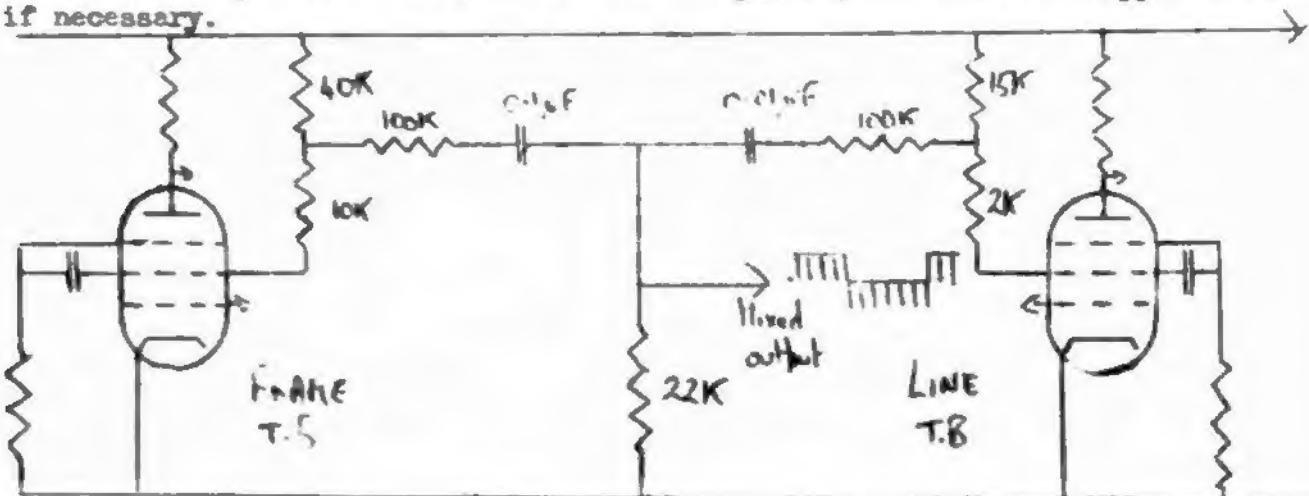
USEFUL CIRCUITS SECTION - Contd.

Following last quarter's article on a simple phase delay blanking pulse generator, it has been found possible to simplify even further. Readers will remember that the idea was to start with the transitron screen pulse for sync purposes, and to generate a sawtooth from this which is then used to trigger a blanking pulse generator. Now, since the transitron itself will normally be providing a sawtooth for scanning purposes, this can be used as the adjustable trigger voltage. However, since the sawtooth is negative going, it must be applied to the cathode of the multivibrator:



Simplified Blanking pulse generator.

Many members use the screen pulses for sync purposes, and usually it is necessary to mix line and frame pulses to form a composite sync signal. Some difficulty arises with certain types of mixer circuit, due to the line pulses feeding through the mixer and back into the frame circuit, or vice versa. This causes a curious type of raster lock, and usually the whole raster is pulled out of shape. A better method, with the advantage that no mixer tubes are required, is shown in the figure below. The resistors in the screen are adjusted for sufficient pulse voltage without draining off so much that the raster size is affected. Each pulse has a lower impedance path to the output terminal than to the other transitron, and no awkward effects occur. The output is an addition of the two pulses, and must be clipped later if necessary.



Simple Sync Mixer for use with Transitrons



"WHAT THE OTHER FELLOW IS DOING."

Good batch of mail this month; must have been the photos that did it.

Here's JOHN HAIN, who gives his home QTH as 228, Bally Rd, Doncaster. John has been struggling with Holme Moss, and hopes to get going on a telestills unit at Easter. He and friend ROBERT BUCHANAN managed 90 assatd tubes and a VCR158 for £5, and are well away! New member JACK LANE G3AAW of Stroud has been clearing faults in his interlace generator caused by poor resistors, but is now getting some fb telestills pictures on

his 9" monitor. JOHNNY FLOWMAN G3AST points out that if any hum is still left in the output of that stabilised PSU given in the last edition, 8uF between the cathode of V1 and the control grid of V2 will do the trick. Your scribe reports that the unit is OK as was, however...! BERT NEWMAN G2FIX says that he is stocking up on TV data preparatory to having a go later on in the year. R.PALMER G5PP, who is RSGB C.R for Warwickshire, writes in to agree with policy, as do many others. R.E.WATTS G2RD has been held up for lack of 951As, and appeals for anyone with a cheap source of same to let him (and us) know.

DAVE BISHOP has been on a GPO course at Stone again, and says that SANDY WEMYSS should just about be demobbed by now. Dave hopes to put Weymouth on the amateur TV map, and is starting morse practice for that -ugh-ticket. GEORGE SHORT is now at East Heckington, Lincs, and is stuck for a telephone. He has been snowed under with comm'l TV orders, as have many of our dealer-members, but can get 3 Mc/s out of his 5527 equipment with very good sensitivity. Unfortunately, the 5527 heater has gone open circuit, and George has been refused permission to import a spare. Any member having two, please tell George. He has added a VCR97 viewfinder to the top of the camera unit, and has also been trying out Flying spot scanning with a Mullard projection unit. He confirms that these tubes are no use for telestills work due to the afterglow, but are quite OK for F.S work. By the way, For studio scenes, George uses 4 2 kW lamps and an overhead bank of TWELVE No. 2 Pictofloods! He says that it is warm, but "looks like A.P on the monitors"!

AL BEVINGTON G5KS is stirring up activity in the Bradford area, and is another suffering from 5527-itis. He has contacted ROY LAND, and they are hoping to form a TV group up there. JOHN WOODFIELD G3IZK is now active on 2m, but will be going home to Manchester at Easter to the Radio Show. John works on telecine equipment, professionally, and offers to show BRTC members the gear provided he is not too busy at the time. It handles 35mm and 16mm married or unmarried film, 16mm S.O.T, slides and filmstrips; there is a single frame condition on motion, lift and gamma control, pos or neg working, and automatic film shrinkage compensation - just £16,000, men... For his own private pulser, John needs some 6SN7s, and asks if anyone has a cheap source? DON BRADFORD G3GBO has been busy with exams, but has been doing some good work on the VHF's. JIM RUSSELL of Bournemouth has been improving his 5527 gear, and also giving BORJE CEDERQVIST OH2NL a hand by post. Borje has at last demonstrated his gear to an astounded public (!), and has had some very good write-ups, plus a short film! His 5527 unit is extremely neat in appearance, and is built into a box only some 10"x 8"x 6". He is using a 7" monitor unit, but with 250 lines 50 frames, pictures are not yet very

good. However, Borje suffers from not having a comml programme to compare results with.

Grant Dixon has been as busy as ever, and reports that the 5FP7 scanner is much better than the ACR8, and can also be used for Flying Spot work. Grant has tried using an Infra-red Image converter in front of the 931A to give a red-sensitive PEC, but the output is too small to be any improvement on the 931A simple. If only somebody made 931As with a panchromatic response... Grant is trying a 3" magstrip transmitter as a disc-driving motor on the colour rig. He paid a visit to Pye's whilst on a visit to Cambridge, and had a good look at their colour gear, courtesy Mr C.R.Thompson. He is also, it is rumoured, building another pulse generator...!

FRED ROSE G3BLV has been busy professionally, and has not yet got down to the 5527 unit. He has given a couple of shows with the telecine equipment locally, and hopes to go on the air in April with 25 watts on 70cms vision and 150 watts sound on 40m. He is experimenting with GSACK at Blyth, about 20 miles away, and would appreciate reports. IAN MACWHIRTER G3ETI says that his amplifier is now stable - 78 dBs gain, 3 dBs down at 2.5 Mc/s. Ian has 150 watts on 2m, and 6 watts on 70 cms, and is rarin' to go on TV on 70, but cannot afford the licence. Both Ian and Fred moot the idea of a Northern TV Convention. Any offers? DOUG WHEELER G3AKJ and OW BROWN continue to give TV lectures in the Romford area, and now have good results from their 30/- 5527. It appears that the other night they had to wheel the whole lot 4 miles in a pram at 11.30 at night, and were stopped by the police! However, all was satisfactorily explained, and Doug is now trying to form a definite TV group in the area - Essex seems to have a huge number of BATC members! Doug also has a couple of 3 kW low voltage carbon arc lamps with Xformers for TV dems. BILL WHITE reports that he has itchy fingers, but is unable to do anything at the moment, as he is getting married in April. Congratulations to you both from the BATC, Bill, and lots of luck to you. Bill and Mrs White will be moving to Manchester - Ian pse note. R.A.Gower of Croydon is looking for aid in his area; D.P.Rafferty has moved his home, and has not had much chance to improve the telestill unit. He still does TV transmission professionally.... on microwaves, too. Dalton Raby G3IDR is now in Germany with the BAOR, and hopes to be on the air as the first DL2 TV station, in conjunction with DL1FM. BILL HILL and LE S ALLEN G3MZ have at last realised that they are in the same firm, and are getting together to whip up some enthusiasm. Bill's lighting gear is still available for anyone who needs it.

ROBERT TORRENS G13FW/T is really catching up now. He has been active with a pr of 8012s on 70 cms, and also has a camera unit under construction. Robert hopes to get across 100 miles of sea to GMs 5VG, SRDA and possibly 4JO on TV. MICHAEL BIRLOW G3CV0 (Who??) is pleased to announce that after 4 weeks hard work at Christmas, the gear is almost entirely rebuilt, and is also finished in grey and black enamel... The master saw-teeth are generated by 4 Z77s, and a 6SN7 gives a variable blanking pulse. The ACR2X scanner is being replaced by a 5FP7 for flying spot work, and the whole unit will be mounted over the top of the sound transmitting gear for one-man operation. Tests on 70 cms continue, and it is hoped to put out some TV over Easter if a short-term licence can be had from the GPO.

RUSSELL L.SPERA W2UFU of New York City, writes in to say he and the gang are active on 70 cm TV with the ole' 5527. Russ is going to send the data on later, and meanwhile is active on all bands and looking for TV QSOs. ALAIN DECIVEL F9MN is now back in France with a large supply of useful parts; how's things, Alain? HENDRIK DE WAERD PA5ZX is presumably in Sweden, as we have no news of him this time.

